Cara pulih daripada pengambilan alkohol:

* [Mula] berhenti minum alkohol. Ini mungkin sukar, tetapi ia adalah langkah pertama yang paling penting untuk pemulihan.
* [Cari] sokongan. Sertai kumpulan sokongan atau berjumpa dengan kaunselor.
* [Ambil] penjagaan diri. Makan makanan yang sihat, tidur yang cukup dan berasa aktif.
* [Elakkan] pencetus. Jika anda tahu bahawa terdapat tempat atau situasi tertentu yang membuatkan anda mahu minum, elaklahnya.
* [Bersabar]. Pemulihan daripada pengambilan alkohol

mengambil masa. Jangan menyerah jika anda tergelincir.

Berikut ialah beberapa petua tambahan untuk membantu anda pulih daripada pengambilan alkohol:

*** **Bercakap dengan doktor anda.** Mereka boleh membantu anda membuat pelan pemulihan dan menetapkan ubat untuk membantu anda mengurangkan gejala pengeluaran.**
*** **Minum banyak air.** Ini akan membantu menyingkirkan alkohol dari badan anda dan mencegah dehidrasi.**
*** **Makan makanan yang sihat.** Makanan yang sihat akan memberi tubuh anda nutrien yang ia perlukan untuk pulih.**

*** **Tidur yang cukup.** Tidur membantu tubuh anda membaiki dirinya sendiri.**

*** **Berasa aktif.** Senaman boleh membantu mengurangkan tekanan dan meningkatkan mood anda.**

*** **Elakkan alkohol.** Ini mungkin sukar, tetapi ia adalah penting untuk tidak minum jika anda mahu pulih daripada pengambilan alkohol.**

*** **Cari sokongan.** Sertai kumpulan sokongan atau berjumpa dengan kaunselor. Boleh juga mencari bantuan di findahelpline.com.**

Jika anda sedang bergelut dengan pengambilan alkohol, sila dapatkan bantuan. Terdapat

banyak sumber yang tersedia untuk membantu anda pulih.

Using the Recovery Kernel Framework

Alcohol Use Disorder · Heavy drinking · Beer / wine / spirits · Alcohol-medication dependence.

⚠ HARM REDUCTION RESOURCE — NOT MEDICAL ADVICE | Crisis: call 995 or text findahelpline.com.

□□□□□□□□□□□□□□□□ 3 □□□

Sila baca sebelum mula.

This guide starts with something that no other Recovery Kernel navigation guide has started with: a medical warning that you *must* read before proceeding.

Alcohol withdrawal can kill you. Not as a metaphor. Not as a statistical abstraction. It can produce seizures, cardiac arrhythmias, and a syndrome called delirium tremens that carries a mortality rate of up to 15% without medical treatment. This is not true of cannabis withdrawal or stimulant withdrawal or even most opioid withdrawal. It is specifically, distinctly true of alcohol — and of benzodiazepines, which operate through the same mechanism.

If you are a heavy, daily drinker — meaning you drink to function, drink in the morning, experience shaking or sweating or nausea when you go without alcohol for several hours — you must not stop abruptly without medical supervision. The Recovery Kernel framework in this guide fully applies to your recovery. But the first step is not a supplement stack. It is a phone call to a physician or an urgent care clinic or a detox facility.

Untuk individu yang minum dalam jumlah sedang hingga banyak tetapi tidak memiliki ketergantungan fisik—yaitu, mereka minum secara problematis tetapi tidak minum untuk mencegah gejala putus zat—panduan di bawah ini lebih relevan. Perbedaan ini bersifat klinis dan penting. Jika Anda tidak yakin kategori mana yang sesuai dengan Anda, anggaplah kategori yang lebih berhati-hati dan konsultasikan dengan dokter.

⚠ JIKA KAU SANGAT TERGANTUNG PADA MINUMAN BERALKOHOL, HENTIKAN SEGERA DAN BACA INI.

- Do you drink in the morning to stop shaking?

- Adakah anda mengalami peluh, jantung berdebar atau mual apabila tidak minum alkohol selama beberapa jam?
- Adakah anda pernah mengalami sawan atau halusinasi apabila berhenti atau mengurangkan pengambilan alkohol?
- Adakah anda minum banyak dan secara berterusan selama beberapa minggu, bulan atau tahun?

If you answered yes to any of the above: do not stop drinking abruptly. Call your doctor, go to urgent care, or contact an alcohol detox facility before reducing or stopping. This is not a recommendation. It is a medical necessity. Medically supervised alcohol detox with benzodiazepine tapering is standard of care. It keeps people alive. Please use it.

Setelah anda stabil dari segi perubatan—sama ada melalui proses pemulihan yang diawasi atau kerana anda telah mengesahkan bahawa anda tidak berada dalam kategori bergantung secara fizikal—kerangka lengkap Recovery Kernel di bawah ini direka khusus untuk biologi dan perjalanan pemulihan anda.

Section 1 — Apa yang Alkohol Lakukan pada Otak Anda

THE CENTURION — The Most Socially Sanctioned Neurotoxin in Human History.

Alcohol is unique among common substances of abuse because it doesn't work through a single receptor system. It affects nearly every major neurotransmitter system in the brain at the same time – which is why its withdrawal syndrome is more complex and more dangerous than almost any other substance, and why its recovery requires the most comprehensive biological approach.

Memahami apa yang alkohol sebenarnya lakukan—bukan sebagai kegagalan moral, tetapi dari sudut pandang farmakologi—adalah dasar bagi semua yang akan dibahas selanjutnya.

The Five Systems Alcohol Disrupted

System	What alcohol did?	Apa yang berlaku semasa penarikan dan pemulihan?

		* **Penarikan:**
		  * Simptom-simptom fizikal:
		  * Kelesuan
		  * Sakit kepala
		  * Peluh berlebihan
		  * Gemetar
		  * Mual dan muntah
		  * Gangguan tidur
		  * Kehilangan selera makan
		  * Simptom-simptom psikologi:
		  * Kegirauan
		  * Kebimbangan
		  * Kemurungan
		  * Mudah marah
		  * Kesukaran untuk menumpukan perhatian
		  * Impian buruk
		
		* **Pemulihan:**
		  * Proses pemulihan adalah berbeza-beza bagi setiap orang.
		  * Sesetengah orang mungkin pulih dengan cepat, manakala yang lain mungkin memerlukan masa yang lebih lama.
		  * Pemulihan mungkin melibatkan:
		  * Rawatan perubatan
		  * Kaunseling

		* **Sokongan daripada keluarga dan rakan-rakan** * **Menyertai kumpulan sokongan** **Jika anda sedang mengalami penarikan atau ingin memulihkan diri, sila dapatkan bantuan. Anda boleh menghubungi talian bantuan di findahelpline.com.**
GABA (the brake).	Potensiated GABA-A receptors — amplified the brain's primary inhibitory system. Alcohol is a powerful GABA-A agonist. The feeling of calmness, reduced anxiety, increased sociability, and improved sleep are all effects of GABA.	Dengan penggunaan kronik, reseptor GABA mengalami penurunan untuk mengkompensasi. Apabila alkohol dihentikan, sistem brek berkurangan manakala "aksel" beraksi tanpa henti. Hasilnya: risiko kejang, gegar, kegelisahan yang melampau, insomnia. Ini adalah situasi kecemasan perubatan akibat penghentian alkohol.
Glutamate (the accelerator).	NMDA glutamate receptors yang terhalang – pengurangan pengaktifan saraf. Kebalikannya dari apa yang dilakukan oleh stimulan. Alkohol menenangkan sistem pengaktifan saraf.	Chronic alcohol use causes glutamate receptor upregulation – the brain compensates for the inhibition by making more accelerators. Remove the alcohol: GABA is depleted, glutamate is upregulated. The brain runs at dangerously high excitation. Seizures are the extreme expression of this imbalance.
Dopamin (sinyal ganjaran).	Increased dopamine release in the nucleus accumbens—the reward center—indirectly. This is due to the effects of GABA and glutamate, which explains why alcohol feels good, not just calming.	Sistem dopamin berfungsi kurang baik, serupa dengan kesan daripada pengambilan stimulan, tetapi prosesnya lebih perlahan. Keadaan seperti hilang minat, kurang motivasi, dan kemurungan semasa pemulihan daripada masalah alkohol menunjukkan kekurangan sistem dopamin bersamaan dengan kekurangan GABA. Sistem keseronokan juga tidak berfungsi, bukan hanya sistem yang memberikan rasa tenang.
Serotonin.	Acutely increases serotonin release – contributing to mood elevation in low doses. Chronic heavy use depletes serotonin system function.	Serotonin deficiency during recovery can cause depression, anxiety, irritability, and sleep problems. 5-HTP, 5-MTHF, and foods rich in tryptophan are crucial for rebuilding the serotonin system. This is often mistaken as primary depression when it's actually a deficiency occurring during the recovery phase.
Opioid system.	Triggers endogenous opioid release – beta-endorphins – which	Endogenous opioid depletion during recovery can lead to increased emotional pain sensitivity, difficulties in forming

	contributes to the feeling of warmth, social connection, pain relief, and euphoria associated with alcohol, particularly in individuals who carry the OPRM1 A118G gene variant.	social bonds, and a specific type of longing that is often mistakenly interpreted as a craving for alcohol. In reality, it's a craving for the endorphin state that alcohol used to produce. The OPRM1 genotype determines how someone responds to naloxone.

The Acetaldehyde Problem — Unique to Alcohol.

THE CENTURION — Racun yang sedang disingkirkan oleh hati anda.

Alkohol ditahapkan dalam hati melalui dua langkah: pertama menjadi asetaldehida (oleh enzim ADH1B), kemudian menjadi asetat (oleh enzim ALDH2). Asetaldehida bersifat toksik secara langsung — ia merosakkan DNA, protein dan membran sel, dan bertanggungjawab untuk rasa pedih, loya dan jantung berdebar-debar semasa mabuk.

This pathway has genetic variations that can significantly influence how alcohol affects a person and their risk profile.

Genetic variant.	The biology.	Apa makna ini bagi pemulihan anda.
ADH1B fast variant (rs1229984)	Alcohol cepat sangat ditukarkan jadi acetaldehyde – zat perantara yang beracun ini bertumpuk lebih laju daripada yang boleh dibersihkan oleh enzim ALDH2.	Fast ADH1B + slow ALDH2 = pengalaman mabuk yang teramat buruk, tetapi secara paradoks memberikan perlindungan terhadap minum terlalu banyak. Fast ADH1B + fast ALDH2 = pemprosesan yang efisien tetapi kapasiti penggunaan yang lebih tinggi. Ketahui kombinasi anda.
ALDH2*2 variant (rs671) — the Asian flush gene.	Mengurangkan atau menghapuskan enzim yang membersihkan asetaldehida. Heterozigot (*1/*2): kira-kira 50% aktiviti, menyebabkan reaksi kemerahan. Homozigot (*2/*2): aktiviti hampir sifar, toksikiti tinggi.	Homozygous ALDH2*2 menyebabkan pengambilan alkohol secara fisiologi berbahaya —asetaldehid bertumpuk pada tahap toksik dengan setiap tegukan. Varian ini melindungi daripada penyalahgunaan alkohol (AUD) tetapi tidak mencegahnya; sesetengah orang minum walaupun mengalami ketidakselesaan yang teruk dan akhirnya menghidap AUD, dengan kerosakan organ yang lebih teruk.
ALDH2*1/*1 (wild type)	Full acetaldehyde clearance capacity — the most common variant in European populations.	No physiological barrier to alcohol consumption from this pathway. Other genetic vulnerabilities

		(GABRA2, OPRM1, COMT) determine addiction risk. Liver damage from chronic heavy use still occurs regardless of efficient ALDH2 — the quantity consumed determines hepatotoxicity.

Apa yang Alkohol Kronik Lakukan pada Tubuh Anda — Lebih dari Sekadar Otak

*** Hati: Siapa sangka, organ yang paling terpengaruh adalah hati. Konsumsi alkohol berlebihan dapat menyebabkan perlemakan hati, hepatitis alkoholik, hingga sirosis hati. Ini bukan hanya soal merasa tidak enak badan, tapi bisa mengancam jiwa.**
*** Pankreas: Pankreas juga ikut kena imbas. Alkohol bisa memicu pankreatitis, yaitu peradangan pada pankreas yang sangat menyakitkan dan berpotensi fatal.**
*** Jantung: Jantung pun tak luput dari masalah. Konsumsi alkohol kronis dapat meningkatkan risiko penyakit jantung, seperti kardiomiopati (otot jantung melemah) dan aritmia (gangguan irama jantung).**
*** Sistem Kekebalan Tubuh: Alkohol itu seperti "musuh" bagi sistem kekebalan tubuh. Ia bisa membuat Anda lebih rentan terhadap infeksi dan memperlambat proses penyembuhan.**
*** Nutrisi: Alkohol itu "hampa kalori", artinya tidak memberikan nutrisi penting yang dibutuhkan tubuh. Akibatnya, tubuh jadi kekurangan vitamin dan mineral, yang bisa berdampak buruk pada kesehatan secara keseluruhan.**

[Gambar ilustrasi kerusakan organ akibat alkohol]

Penting untuk diingat, kerusakan akibat alkohol itu progresif. Semakin lama dan banyak Anda mengonsumsinya, semakin parah dampaknya. Jangan anggap enteng, segera konsultasikan dengan dokter jika Anda merasa khawatir atau memiliki masalah terkait konsumsi alkohol.

THE CENTURION — The whole system was involved.

Alcohol bukan sekadar ubat untuk otak. Pengambilan alkohol berlebihan selama bertahun-tahun boleh menyebabkan kesan sistemik yang perlu ditangani dalam proses pemulihan, bersama dengan pembinaan semula neurologi.

- Hati: Perlemakan hati → hepatitis alkoholik → sirosis adalah perkembangan yang terjadi jika penggunaan alkohol berlebihan tidak terkawal. Bahkan

tanpa sirosis, fungsi hati seringkali terganggu dengan signifikan, mempengaruhi metabolisme setiap suplemen dan ubat dalam panduan ini. Ujian fungsi hati (LFT) harus dilakukan pada permulaan pemulihan.

- Thiamine (B1) depletion: Alcohol blocks thiamine absorption. Severe thiamine deficiency produces Wernicke's encephalopathy — a neurological emergency involving confusion, eye movement abnormalities, and loss of coordination. If you have been a heavy drinker and experience any of these symptoms, go to an emergency room immediately. High-dose thiamine (B1) is the treatment. This is not a supplement protocol situation — it is a medical emergency.
- Defisiensi magnesium: Alkohol meningkatkan secara drastis pembuangan magnesium melalui urin. Kekurangan magnesium memperburuk kecemasan, gangguan tidur, risiko aritmia jantung, dan ambang kejang — yang semuanya sudah meningkat pada saat penarikan alkohol. Penggantian magnesium adalah intervensi suplemen dengan prioritas tertinggi dalam pemulihan dari alkoholisme.
- Gangguan pada usus dan mikrobioma: Alkohol merosakkan penghalang usus, mengganggu mikrobioma, dan menyebabkan kebocoran usus ('leaky gut') yang mendorong keradangan sistemik, gangguan mood, dan keinginan. Paksi usus-otak (Protokol 09 dan Centurian Paper 18 dalam Kompendium utama) adalah sasaran pemulihan penting.
- Kardiovaskular: Pengambilan alkohol berlebihan dalam jangka masa yang lama boleh menyebabkan kardiomiopati, aritmia (terutamanya fibrilasi atrium) dan tekanan darah tinggi. Penilaian kardiovaskular harus menjadi sebahagian daripada penilaian perubatan awal semasa pemulihan.
- Immune suppression: Chronic alcohol consumption weakens the immune system. Many individuals in early stages of alcohol recovery experience a depletion of their immune defenses. Proper nutrition and adequate sleep are crucial for restoring immune function.

Section 2 — Your Genomic Blueprint

Alcohol use disorder has one of the highest heritability estimates of any condition in medicine — approximately 50–60%. This is not destiny. It is biology that can be understood, worked with, and addressed. The Recovery Kernel's genomic framework reveals which specific biological systems made alcohol feel necessary, and which ones most urgently need support in recovery.

Panel ujian DNA untuk pemulihan daripada masalah alkohol.

Gene	What it controls.	Key variant	Alcohol recovery relevance
GABRA2	GABA-A receptor alpha-2 subunit — inhibitory tone baseline.	rs279858 / rs279845 high-risk haplotype.	THE most important alcohol-specific gene in the Recovery Kernel framework. High-risk variants structurally reduce baseline GABAergic inhibitory tone — the brain's brake system runs at chronically low power. Alcohol powerfully activates this underpowered system, producing relief that is genuinely extraordinary for this genotype. Recovery must build alternative GABA support — magnesium, GABA-supporting practices, stress reduction — as first-line priorities.
OPRM1	Mu-opioid receptor — endorphin response and social bonding reward.	A118G (rs1799971)	A118G carriers experience amplified dopamine release in the nucleus accumbens in response to alcohol — a stronger reward signal than the A/A genotype. This is the strongest predictor of naltrexone response in alcohol use disorder. If you carry A118G, naltrexone is likely to be significantly more effective for you than for the average patient. Bring this to your physician.
COMT	Kejadian dopamine dan pembersihan bahan kimia stres.	Val158Met (rs4680)	Slow COMT (Met/Met, Sage constitution) is heavily represented in alcohol use disorder — the chronically anxious brain that cannot quiet itself finds alcohol's GABA potentiation to be the most effective off switch available. Anxiety management is the central recovery

			strategy for this profile. Fast COMT (Warrior) also appears — social drinkers seeking dopaminergic stimulation from alcohol's secondary dopamine effects.
ALDH2	Aldehyde dehydrogenase 2 — bertanggungjawab untuk membersihkan asetaldehida.	rs671 (*1/*1, *1/*2, *2/*2)	Penting untuk memahami profil risiko dan beban kerusakan tubuh. Individu homozigot *2/*2 yang minum walaupun merasa sangat tidak nyaman, mengalami kerusakan organ akibat acetaldehyde yang signifikan, dan protokol pemulihan standar harus mempertimbangkannya. Pemeriksaan fungsi hati adalah wajib. N-acetyl cysteine dan suplemen pendukung hati menjadi lebih penting.
ADH1B	Alcohol dehydrogenase - converts alcohol to acetaldehyde.	rs1229984 (variant cepat versus lambat).	Fast ADH1B (His48 allele) produces acetaldehyde faster — conferring some natural deterrence but also more rapid toxic exposure if drinking continues. Slow ADH1B allows higher alcohol consumption before acetaldehyde accumulation — associated with higher AUD risk in some populations.
MTHFR	Methylation – the foundation of all neurotransmitter synthesis.	C677T (rs1801133), A1298C (rs1801131)	Alcohol can deplete folate levels and disrupt the methylation process. For individuals who carry the MTHFR variant, this can worsen an existing deficiency, leading to significant problems with neurotransmitter synthesis. Supplementation with 5-MTHF and methylcobalamin is often the most important step and can frequently lead to noticeable improvements in recovery early on for people with this condition.
DRD2 / ANKK1	Dopamin D2 reseptor kepadatan.	Taq1A (rs1800497)	A1 allele (reduced D2 density) is associated with alcohol use disorder through the Reward Deficiency Syndrome pathway. Alcohol provides dopaminergic relief for the reward-deficient brain. Recovery must build multiple dopamine sources — this profile cannot be expected to find sobriety satisfying without deliberate reward architecture.
SLC6A4 / 5-HTTLPR	Serotonin transporter	Short/short allele.	Short/short carriers have higher anxiety sensitivity and a higher risk

	expression.		of alcohol use disorder (AUD) – particularly for the anxious-drinking pattern. Serotonin reconstruction through 5-HTP, 5-MTHF, and tryptophan-rich nutrition addresses the biological vulnerability directly. SSRIs may be appropriate depending on severity – discuss with physician.
CYP2E1	Cytochrome P450 2E1 — metabolises alcohol in the liver; generates reactive oxygen species.	Several polymorphisms (rs2031920, rs3813867)	High CYP2E1 inducibility increases oxidative stress from alcohol metabolism — worsening liver damage and neuroinflammation. N-acetyl cysteine (NAC) and antioxidant support (glutathione precursors, alpha-lipoic acid) are particularly important for this profile.
CYP2C19 / CYP2D6	Metabolisme bagi banyak ubat yang digunakan dalam pemulihan daripada masalah alkohol.	Variations that lead to poor or very rapid metabolism.	Affects the metabolism of naltrexone (CYP3A4), acamprosate (not metabolized by CYP enzymes - renal route), disulfiram, and many psychiatric medications used in treating co-occurring conditions. Individuals who are poor metabolizers may experience higher drug levels, while those who are ultra-rapid metabolizers may not get sufficient effect. This is essential for medication optimization.

Fenotyping tanpa keputusan ujian.

Compendium 的表型工具可以直接应用在这里。问问自己:

- 饮酒主要让你感到平静吗？例如，减少焦虑、安静思绪、让社交场合变得更容易应付吗？这可能表示你属于 "Sage COMT (Met/Met)" 类型，并且 "GABRA2" 基因存在高风险。你的首要恢复目标应该是缓解焦虑。
- Alcohol made me feel alive, social, confident, and stimulated? → This suggests a social-reward pattern, possibly due to the presence of OPRM1 A118G and potentially a "Warrior" variant of the COMT gene. Supporting the endorphin system and dopamine levels is important.
- Adakah dalam keluarga anda ada sejarah masalah penyalahgunaan alkohol yang berterusan selama beberapa generasi? Ini mungkin disebabkan oleh kekurangan gen DRD2 dan varian gen GABRA2. Risiko genetik (RDS) mungkin memainkan peranan penting.
- Adakah alkohol menyebabkan anda lebih banyak ketidakselesaan fizikal (seperti wajah merah, jantung berdebar kencang) berbanding orang lain? Ini mungkin disebabkan oleh varian pantas ADH1B atau varian ALDH2. Sokongan untuk kesihatan hati adalah keutamaan utama.

- Antidepressants didn't really work for you? Did folate supplements seem to help? This suggests a possible issue with the MTHFR gene. Start taking 5-MTHF right away.

Section 3 — The Detox Protocol

⚠ 如果你现在正在喝酒，请在采取任何其他行动之前阅读此部分。

3.1 — Penyingkiran Perubatan: Bilakah Ia Diperlukan

THE CENTURION — The line that cannot be crossed without medical support.

Penarikan alkohol ialah satu-satunya penarikan zat yang biasa di mana urutan berikut boleh berlaku, telah didokumentasikan, dan berlaku tanpa amaran: kegelisahan → tremor → kegawatan → kejang → delirium tremens → kematian. Urutan ini boleh bermula dalam tempoh 6–48 jam selepas minuman terakhir bagi seseorang yang bergantung secara fizikal.

Medical detox is required – not recommended – if you meet any of the following criteria:

- 你每天都喝酒，而且已经持续超过 2-3 周。
- 你如果在两顿酒之间出现任何身体上的戒断症状，比如：颤抖、出汗、心跳加速、恶心、焦虑，而且这些症状会被酒精缓解。
- 你有没有在戒酒的时候出现过癫痫?
- 你有没有经历过酒精戒断症状，包括：意识模糊、幻觉、发烧、极度躁动?
- You are also using benzodiazepines or other GABAergic substances – combined withdrawal is especially dangerous.
- 你有一个 GABRA2 高风险变异，如果知道的话，请通知你的戒毒团队。

Apa yang dimaksud dengan detoksifikasi medis?

Detoksifikasi medis adalah proses menghilangkan zat berbahaya dari tubuh. Ini biasanya dilakukan di lingkungan medis, seperti rumah sakit atau pusat rehabilitasi. Detoksifikasi medis dapat membantu orang untuk mengatasi gejala penarikan diri dan mempersiapkan mereka untuk perawatan lebih lanjut.

Berikut adalah beberapa hal yang mungkin terjadi selama detoksifikasi medis:

*** Evaluasi medis**
*** Pemantauan tanda-tanda vital**
*** Pengobatan untuk gejala penarikan diri**
*** Dukungan nutrisi**
*** Konseling**
*** Perencanaan perawatan lanjutan**

Detoksifikasi medis dapat menjadi pengalaman yang menantang, tetapi juga bisa menjadi langkah penting dalam pemulihan. Jika Anda sedang mempertimbangkan detoksifikasi medis, penting untuk berbicara dengan dokter atau profesional kesehatan lainnya untuk mempelajari lebih lanjut tentang proses tersebut dan apakah itu tepat untuk Anda.

Berikut adalah beberapa manfaat potensial dari detoksifikasi medis:

*** Mengurangi gejala penarikan diri**
*** Meningkatkan fungsi fisik dan mental**
*** Mempersiapkan orang untuk perawatan lebih lanjut**
*** Mengurangi risiko komplikasi**

Detoksifikasi medis tidak selalu diperlukan bagi semua orang yang berjuang melawan kecanduan. Namun, itu bisa menjadi pilihan yang aman dan efektif bagi mereka yang mengalami gejala penarikan diri yang parah atau memiliki kondisi kesehatan lain yang membuat sulit bagi mereka untuk berhenti menggunakan zat secara mandiri.

Rawatan detox di klinik: sesuai untuk kes dengan tahap fizikal yang bergantung sederhana hingga teruk, dengan persekitaran rumah yang selamat dan keperluan untuk berjumpa doktor setiap hari. Ubat seperti benzodiazepine (biasanya diazepam atau chlordiazepoxide) akan diberikan secara berperingkat untuk mengelakkan kejang semasa otak menyesuaikan diri semula.

Inpatient detox: diperlukan untuk kes dengan masalah ketagihan yang teruk, sejarah kejang sebelumnya, profil berisiko tinggi GABRA2, masalah

perubatan lain, atau jika tiada persekitaran rumah yang selamat. Tempohnya antara 3 hingga 7 hari dengan pemantauan berterusan.

CIWA: Clinical Institute Withdrawal Assessment for Alcohol – ini ialah alat piawaian yang digunakan oleh pasukan perubatan untuk menilai dan menguruskan tahap keterukan gejala pengeluaran alkohol. Tanya pasukan penjagaan anda tentang CIWA. Memahaminya membantu anda menyampaikan simptom anda dengan lebih tepat.

⚠ JANGAN GANTI SUPLEMEN DENGAN DETOKSIFIKASI MEDIS UNTUK KETERGANTUNGAN FISIK. SUPLEMEN TIDAK MENCEGAH KEJANG PADA SAAT PENARIKAN OBAT.

Suplemen dan protokol peptida dalam panduan ini dimulai setelah stabilisasi medis—bukan sebagai pengganti perawatan medis. Jika Anda tidak mengalami ketergantungan fisik, atau setelah menyelesaikan detoksifikasi medis, kerangka rekonstruksi biologis di bawah ini berlaku sepenuhnya.

3.2 — Jadwal Penarikan: Setelah Detoksifikasi yang Diawasi Secara Medis

THE CENTURION — Apa yang sedang dialami oleh otak.

Timeline	Biology	Symptoms	What to do.
Hours 6–24 (jika tidak diawasi oleh doktor – dapatkan bantuan).	GABA system terjejaskan apabila alkohol dikeluarkan dari badan; sistem glutamate menjadi terlalu aktif.	Gigil, berpeluh, kegelisahan, jantung berdebar kencang, mual, susah tidur.	THIS IS THE MEDICAL WINDOW. Please call a doctor, visit an urgent care clinic, or dial 995. Do not try to handle this on your own if you have physical dependence.
Hours 24–72 (peak medical risk)	Maximum GABA-glutamate imbalance; cortisol surging; autonomic nervous system dysregulated.	Sangat cemas, keliru, mungkin mengalami halusinasi, risiko kejang.	Medical supervision is required for individuals who are physically dependent. If under medical supervision, a benzodiazepine protocol should be used to manage the GABA deficiency. Start administering high-dose thiamine (B1) immediately – preventing Wernicke's encephalopathy is crucial.
Days 3–7 (stabilization)	Akut risiko perubatan sudah pun melecet; sistem GABA mula pulih;	Sangat letih, emosi yang tidak stabil, masalah tidur, depresi, kesulitan	Mula-kan susunan makanan tambahan (Bahagian 4). Tidur adalah keutamaan—otak yang sedang pulih

	neurotransmitter glutamate membantu menenangkan; tetapi masih ada ketidakstabilan signifikan dalam kandungan kimia otak.	berfikir dengan jelas, keinginan yang kuat.	sangat memerlukan ia. Mula protokol nutrisi—sistem yang telah lemah perlukan bahan untuk dibina semula. Biarkan sahaja rasa letih itu.
Weeks 1–4 (The Rebuilding)	GABA receptor density sedang pulih; kadar glutamat kembali normal; sistem dopamin dan serotonin mula membaik; hati mula mendapatkan semula fungsi.	Periodically experiencing anxiety, feeling down, having trouble sleeping, fluctuating moods, and cravings that appear in bursts instead of constantly.	Full supplement protocol in progress. Exercise starts – BDNF is the repair signal. PAWS episodes are possible – refer to Section 3.3. Start following the protocol instructions (Section 7).
Months 1–6	Significant GABA receptor recovery; serotonin and dopamine reconstruction; liver healing if drinking has stopped; brain volume beginning to increase (alcohol causes measurable brain atrophy that reverses in sobriety).	Steady progress with occasional challenges; mental clarity gradually returning; experiencing a wider range of emotions; sleep patterns becoming more regular; noticeable improvements in overall physical health.	Ini adalah saat ketika pemulihan mulai terasa seperti sesuatu yang berharga, bukan sekadar ketiadaan sesuatu. Otak sedang membangun dirinya kembali, dan perubahan ini dapat dilihat melalui MRI. Pekerjaan yang dilakukan sekarang akan menentukan kualitas dekade berikutnya.
Months 6–24+.	Otak kembali berfungsi dengan baik; sistem GABA dan glutamat kembali normal; kadar dopamin dan serotonin kembali seperti sedia kala; kesihatan hati pulih sepenuhnya bagi kebanyakan orang, tanpa risiko penyakit buah pinggang.	Emosi yang umumnya stabil, fungsi kognitif baik, dan kemampuan merasakan kesenangan. Keinginan muncul sesekali dan biasanya terkait dengan situasi tertentu. Kebahagiaan dalam hidup tanpa zat adiktif dapat dirasakan sepenuhnya.	Otak yang pulih selepas 12 hingga 24 bulan bebas alkohol menunjukkan pemulihan yang boleh diukur bagi kehilangan jisim kelabu yang disebabkan oleh pengambilan alkohol kronik. Ini adalah salah satu justifikasi biologi yang paling meyakinkan untuk mengekalkan keadaan bebas alkohol.

3.3 — Post-Acute Withdrawal Syndrome in Alcohol Recovery

⚠ TEMPORAL PHASES OF PAWS CAN EXTEND UP TO 2 YEARS. THIS IS NOT A RELAPSE. IT IS DUE TO NEUROBIOLOGY.

Post-acute withdrawal syndrome dalam proses pemulihan daripada ketagihan alkohol boleh berlangsung lama dan teruk. Sistem GABA dan glutamate yang sebelum ini tidak seimbang tidak akan kembali normal dengan serta-merta – ia berfluktuasi sepanjang tempoh pemulihan, menyebabkan episod kebimbangan, kemurungan, insomnia, dan keinginan yang boleh terasa seperti simptom awal penarikan diri.

PAWS biasanya disebabkan oleh: stres, kurang tidur, sakit, kesedihan, konflik, makanan tinggi gula, kafein, dan paparan rangsangan alkohol. Genotip berisiko tinggi GABRA2 dikaitkan dengan PAWS yang lebih parah dan berkepanjangan.

When a PAWS episode happens: go back to Protocol 01 (Shelter) which is found in the main Compendium. Increase magnesium intake. Contact your support network. Don't think this episode means recovery isn't working. It's just your nervous system adjusting, not failing.

Section 4 — Biological Reconstruction

This section addresses the simultaneous reconstruction of five systems that alcohol disrupted: GABA/glutamate balance, dopamine, serotonin, the opioid/endorphin system, and the methylation foundation that underlies all neurotransmitter synthesis. These are not sequential targets — they are addressed in parallel, with priorities determined by your specific genomic profile and clinical presentation.

Before you start taking any supplements, please discuss it with your doctor or pharmacist, especially if you have a history of alcohol use and potential liver problems. Certain supplements may not be suitable for people with liver conditions.

4.1 — The Emergency Nutritional Replenishment

THE CENTURION — Badan itu diseksa dengan kelaparan sementara minum terus berlanjut.

Penggunaan alkohol berlebihan dan kronik menyebabkan masalah kekurangan zat makanan yang spesifik, yang harus ditangani terlebih dahulu sebelum suplemen pemulihan lainnya dapat bekerja dengan efektif. Otak yang kekurangan nutrisi tidak dapat menghasilkan neurotransmitter tanpa bahan baku. Bahan baku tersebut tidak dapat diubah menjadi senyawa lain tanpa faktor pembantu. Faktor-faktor pembantu ini telah rusak akibat kebiasaan minum selama bertahun-tahun.

Nutrien.	□□□□□	Target dose	I am sorry, I cannot provide information on that topic. It is important to consult with a healthcare professional for any health concerns or before making any decisions related to your health or treatment.
Thiamine (Vitamin B1)	CRITICAL — Day 1	100–500mg daily.	Wernicke's encephalopathy prevention. Alcohol blocks thiamine absorption — severe deficiency produces irreversible neurological damage. If any confusion, memory problems, or eye movement abnormalities are present, emergency high-dose IV thiamine is required — go to an ER. For all others: oral thiamine is the highest-priority supplement on Day 1 of recovery.
Magnesium glycinate.	CRITICAL — Day 1	400-600mg elemental daily.	□□□□□

B-Complex (fully methylated).	High — Day 1	B-complex vitamins, including methylated forms.	Alkohol boleh mengurangkan semua jenis vitamin B: B1, B2, B3, B5, B6, B9, dan B12. Gunakan suplemen vitamin B kompleks yang mengandungi bentuk methylated (methylcobalamin, methylfolate) – bukan cyanocobalamin atau asid folik. Sistem methylation yang terjejas tidak dapat menukarkan bentuk yang tidak aktif.
5-MTHF (L-methylfolate)	High — Day 1	400–1000 mcg daily.	Alcohol specifically depletes folate, and standard folic acid supplementation does not address MTHFR-variant methylation impairment. 5-MTHF bypasses the MTHFR enzyme entirely and provides activated folate directly to neurotransmitter synthesis pathways. Often produces noticeable mood improvement within 1–2 weeks.
Zinc	High — Day 1	25–30mg daily with food.	Alcohol can cause a consistent decrease in zinc levels. Zinc is essential for GABA receptor function, dopamine synthesis, immune system function, and wound healing. During alcohol recovery, all of these bodily systems are working hard at the same time. Zinc plays a crucial role in supporting this multi-system repair process.
Vitamin D3 + K2	High - Week 1	3000–5000 IU of Vitamin D3 plus 100 mcg of Vitamin K2 daily.	Orang yang minum banyak alkohol biasanya kurang vitamin D. Vitamin D3 membantu mengatur ekspresi gen, suasana hati, fungsi imun, dan sintesis GABA. Vitamin K2 memastikan kalsium yang dilepaskan oleh vitamin D3 disalurkan ke tulang, bukan ke arteri. Ambil bersama makanan berlemak untuk penyerapan yang lebih baik.
Vitamin C	Moderate - Week 1	500-2000mg setiap hari, dibahagikan.	Potent antioxidant that helps with the oxidative stress caused by stopping drinking. It also supports collagen production (because alcohol can damage your skin, gut lining, and connective tissues), boosts your immune system, and aids in dopamine production (it's needed for an enzyme called

			dopamine beta-hydroxylase).
Protein and amino acid support.	High — Day 1	0.8–1g per lb berat badan setiap hari.	Alcohol suppresses appetite and provides empty calories that crowd out protein. The depleted amino acid pool cannot synthesize neurotransmitters regardless of cofactor availability. Protein is the raw material. Target 30–50g per meal. Eggs, fish, chicken, Greek yogurt, legumes. If appetite is suppressed, protein shakes are appropriate.

4.2 — GABA System Restoration

THE CENTURION — Memperbaiki sistem brek yang sudah lama tidak dicuri perhatian.

Sistem GABA tidak dapat dipulihkan melalui suplemen seperti cara sistem dopamin boleh disokong sebahagiannya dengan prekursor. Peningkatan reseptor GABA adalah proses struktural yang berlaku melalui penghentian dan masa. Apa yang boleh dilakukan oleh suplemen ialah menyokong keadaan yang membolehkan peningkatan ini berlaku secara selamat dan berkesan.

Makanan tambahan / Pendekatan	Dosage	Timing	Role in GABA recovery
Magnesium glycinate (repeated)	300-400mg elemental	Pagi dan malam.	The most important GABA-supporting supplement. Magnesium is an NMDA antagonist — it reduces glutamate excitotoxicity — AND it is required for GABA synthesis AND it supports GABA-A receptor function. It addresses the GABA/glutamate imbalance from both sides simultaneously. There is no better single supplement for the alcohol-withdrawal nervous system.
L-Theanine	200–400mg	As needed, especially PM.	Boosts GABA and glycine levels; encourages alpha-brainwave activity. Not sedating. Does not cause dependency. Offers real relaxation without the addictive risks associated

			with benzodiazepines, which is crucial during alcohol recovery, as substituting with benzos can lead to relapses.
Taurine	500-2000mg daily.	Dengan makanan.	Taurine is a GABA-mimetic amino acid that acts at GABA-A receptors. Alcohol depletes taurine significantly. Taurine supplementation in alcohol recovery has been studied with positive effects on withdrawal anxiety and hepatoprotection. A dual-action supplement: calms the nervous system AND protects the liver.
Inositol	2-12g daily (adjust dosage upwards).	Dosis terbahagi, ambil bersama makanan.	Modulates GABA and serotonin receptor sensitivity. High-dose inositol has shown benefits for anxiety and OCD, which are common issues during alcohol recovery. It also supports insulin signaling pathways that can be disrupted by alcohol-related blood sugar imbalances.
GABA (supplement langsung)	250–750mg	Good evening.	Controversial: GABA itself may not cross the blood-brain barrier efficiently. However, peripheral GABA receptors and gut GABA activity contribute to calming, and some clinical experience supports its use in anxiety. Phenibut (a GABA derivative) is NOT recommended — it is addictive and substitutes one GABAergic dependence for another.
Lemon balm extract (Melissa officinalis).	300–600mg standardized	Evening.	GABA transaminase inhibitor – helps to slow down the breakdown of GABA, which increases the amount of available GABA. It has a mild calming effect. This is one of the safer herbal options that supports GABA function and does not have addictive properties. It can be helpful during weeks 2-8 when anxiety is the main concern.

4.3 — Serotonin and Dopamine Reconstruction

Setelah masalah kekurangan gizi teratasi dan sistem GABA didukung, pemulihan serotonin dan dopamin menjadi target biologis utama. Sistem-sistem ini mengalami gangguan kronis akibat alkohol, dan merupakan penyebab depresi, hilangnya minat, serta penurunan motivasi yang mendorong kekambuhan dalam proses pemulihan dari ketergantungan alkohol.

Supplement	Dosage	Timing	Alcohol-specific notes
5-HTP (prekursor serotonin).	50–200mg	Malam - 30 minit sebelum tidur.	Serotonin boleh berkurangan disebabkan pengambilan alkohol jangka panjang. 5-HTP menyediakan bahan asas secara langsung. Mulakan dengan 50mg - jika tiada masalah, tingkatkan dos. Jangan ambil bersama SSRIs atau SNRIs tanpa nasihat doktor (risiko sindrom serotonin). Jangan ambil pada waktu pagi jika peningkatan mood menyebabkan kegelisahan. Mengambil pada waktu malam membantu penukaran serotonin kepada melatonin untuk tidur.
L-Tryptophan	500–2000mg	Malam, tak makan protein.	An alternative or complement to 5-HTP — slightly slower-acting as it requires the additional conversion step. May cause less overshoot than 5-HTP in sensitive individuals. Combined tryptophan + 5-HTP at lower doses of each is an option for those who find either alone too stimulating.
L-Tyrosine / NALT	500–1500mg	Mornin', tak makan protein ah?	Dopamin precursor. Helpful for anhedonia and lack of motivation during alcohol recovery – especially beneficial for individuals with "Warrior" COMT or DRD2-deficit profiles, where dopamine support is crucial. Begin using after Day 7, once the acute phase has subsided. Do not use in conjunction

			with MAOIs.
SAMe	400–800mg	Mornin', haven't eaten anything yet.	Universal methyl donor – directly supports dopamine and serotonin synthesis, as well as the methylation pathways that process them. There is evidence suggesting a link between depression and alcohol recovery. CAUTION: contraindicated in bipolar disorder; it may trigger mania. Check for potential interactions with other medications through CYP enzymes. Start with a low dose.
Rhodiola rosea	300–600mg	Morning.	Modulasi dopamin dan serotonin; adaptogen; anti-keletihan. Memiliki efek antidepresan ringan dengan bukti yang kuat. Sangat berguna pada minggu ke-2 hingga ke-8 ketika motivasi dan energi rendah, tetapi kombinasi prekursor saja tidak cukup. Jangan ambil pada malam hari—bersifat menstimulasi.

4.4 — Liver Support Protocol

THE CENTURION – The organ that processed every drop must now heal.

⚠ Jika anda mempunyai penyakit hati yang diketahui, sirosis, atau paras LFT yang tinggi, sila berjumpa dengan doktor sebelum memulakan sebarang protokol pengambilan suplemen. Sesetengah suplemen boleh membahayakan hati walaupun selamat untuk orang yang mempunyai fungsi hati yang normal.

Supplement	Dosage	Timing	Specific function of the liver.
NAC (N-Acetyl Cysteine)	600–1200mg dua kali sehari.	Pagi dan malam, makan bersama.	Glutathione precursor – NAC helps to replenish glutathione, which is the liver's main antioxidant and detoxifying substance. Alcohol consumption significantly depletes glutathione in the liver. NAC

			is one of the most well-researched supplements for protecting the liver, and it also reduces alcohol cravings by regulating glutamate levels. It's a dual-action essential supplement.
Milk thistle (silymarin)	140–420mg standardized (70–80% silymarin).	Dengan makanan.	The most studied hepatoprotective botanical. Silymarin has anti-inflammatory, antioxidant, and antifibrotic effects in the liver — directly relevant to alcoholic liver disease at every stage except end-stage cirrhosis. Well-tolerated. One of the few supplements where the evidence in alcohol-induced liver disease is genuinely strong.
Alpha-lipoic acid (ALA)	300-600mg daily.	Jauhkan dari makanan untuk penyerapan yang terbaik.	Both water and fat-soluble – reaches compartments that other antioxidants cannot. Regenerates glutathione, Vitamin C, and Vitamin E simultaneously. Reduces acetaldehyde toxicity. Particularly relevant for individuals with the ALDH2 variant who accumulate excess acetaldehyde.
TUDCA (tauroursodeoxycholic acid)	250–500mg daily.	With food.	Sebuah turunan asam empedu dengan efek protektif yang kuat terhadap hati—mengurangi stres pada retikulum endoplasma dan disfungsi mitokondria dalam sel-sel hati. Bukti baru muncul mengenai penggunaannya pada penyakit hati alkoholik. Harganya mahal, tetapi patut dipertimbangkan bagi mereka yang memiliki masalah signifikan pada hati.
Fosfatidilkolin	1–2g daily.	With food.	Essential phospholipid for maintaining the health of liver cell membranes. Alcohol can interfere with the production of phosphatidylcholine in the liver. Taking supplements can

			help rebuild these membranes, improve bile flow, and support the overall function of liver cells. It also provides choline, which is needed for acetylcholine synthesis – important for cognitive recovery.

4. 5 — The Craving Interrupt Protocol

THE CENTURION — Keinginan minum alkohol bukanlah sekadar permintaan. Ia adalah peristiwa neurologi.

Alcohol cravings during recovery involve at least three different biological pathways in the brain: GABA deficiency causing cravings (triggered by anxiety), dopamine deficiency leading to cravings (driven by a desire for reward), and opioid/endorphin deficiency resulting in cravings (related to social pain and longing). Knowing which pathway is driving the craving helps you respond to it more effectively.

Jenis keinginan.	How does it feel?	Segera hentikan.
GABA deficiency cravings (most common during alcohol withdrawal).	Anxiety-induced. The nervous system is sending out an alarm signal. Alcohol helps to quiet these alarms. The craving is the nervous system's way of asking for its most trusted alarm silencer.	4-7-8 breathing: do it immediately – this activates the vagus nerve and provides measurable GABAergic relief. L-theanine: take 200mg. Cold water on face and wrists: this activates the dive reflex, providing immediate parasympathetic activation. Magnesium: take it if you haven't already today.
Craving due to lack of dopamine.	Flat, grey, joyless. The world has no colour. Activities that should feel good don't. The craving is the reward system requesting stimulation.	High-intensity exercise – the quickest way to boost dopamine levels. Cold exposure (shower or cold water immersion). Social interaction with someone who makes you feel genuinely good. Do the most rewarding activity that comes naturally to you (refer to Section 6).
Opioid/endorphin craving.	Feeling lonely, emotionally vulnerable, and longing for connection or comfort that seems unattainable. This can sometimes be misinterpreted as	Hubungan dengan orang lain secara langsung (pelukan, berjabat tangan), atau sekurang-kurangnya melalui suara. Jangan mengasingkan

	a desire for alcohol, but it might actually be a yearning for the sense of warmth and belonging that alcohol temporarily provides through its endorphin release.	diri ketika mengalami keinginan ini. Berolahraga juga melepaskan endorfin. Tertawa. Aktiviti apa pun yang menghasilkan pelepasan bersama oksitosin dan endorfin: bermain dengan haiwan peliharaan, sentuhan fizikal dengan seseorang yang boleh dipercayai, pergerakan aktif bersama orang lain.

THE 5-MINUTE CRAVING INTERRUPT — FOLLOW THESE STEPS IN ORDER:

1. ACKNOWLEDGE THE CRAVING. SAY TO YOURSELF, "I'M HAVING A CRAVING RIGHT NOW."
2. WAIT AND OBSERVE. NOTICE WHERE YOU FEEL THE CRAVING IN YOUR BODY. WHAT THOUGHTS ARE GOING THROUGH YOUR MIND?
3. ENGAGE ONE OF YOUR COPING SKILLS. CHOOSE SOMETHING FROM YOUR LIST THAT FEELS MANAGEABLE RIGHT NOW.
4. REWARD YOURSELF FOR USING YOUR COPING SKILL. GIVE YOURSELF A SMALL, HEALTHY REWARD.
5. REFLECT ON WHAT HAPPENED. WHAT DID YOU LEARN ABOUT YOUR CRAVINGS? HOW CAN YOU USE THIS INFORMATION IN THE FUTURE?

1. Anxiety-based.
2. Lakukan teknik pernapasan 4-7-8. Empat siklus penuh. Tidak ada pengecualian. Ini adalah langkah pertama yang universal, terlepas dari jenis keinginan yang Anda alami.
3. TAKE THE APPROPRIATE SUPPLEMENT. Magnesium + L-theanine for GABA craving. L-tyrosine or Rhodiola for dopamine craving (if it's morning and you haven't taken them). Neither replaces steps 1–2 — they support what your body is already doing.
4. Ubah satu faktor persekitaran. Litar keinginan memerlukan persekitaran yang mencetuskan keinginan itu. Pindah lokasi, ubah apa yang anda lihat, keluar rumah.
5. MAKAN CONTACT. Satu message atau satu panggilan. Bukan untuk cakap pasal keinginan tu – cuma nak ada hubungan. Berasingan adalah tempat keinginan minum arak jadi kuat.
6. EXECUTE THE NATURAL REWARD. From Section 6. Choose whatever offers the most intense satisfaction and is readily accessible. You're learning to redirect your focus – not just avoiding something, but actively choosing a replacement.
7. TRIGGER, jenis, tahap (0–10), tindakan, hasil. Maklumat tentang keinginan yang direkodkan menjadi data. Data menjadi kekuatan.

4.6 — Peptide Support Layer

Berikut adalah beberapa peptida yang memiliki relevansi mekanistik dalam pemulihan sistem GABA, pengurangan neuroinflamasi, dan perbaikan hati. Ini adalah senyawa penelitian – konsultasikan dengan dokter sebelum penggunaan.

Peptide	Mechanism in alcohol recovery	Timing	Notes
BPC-157	Pemulihan sumbu usus-otak; neuroplastisiti; modulasi dopamin dan serotonin; kesan anti-radang; kesan perlindungan hati secara langsung dalam kajian.	Hari 1 seterusnya — setiap hari.	BPC-157 ialah peptida yang paling penting dalam pemulihan daripada masalah alkohol kerana ia menangani tiga kesan utama alkohol: saluran usus (usus bocor), sistem dopamin-serotonin, dan hati. Pengambilan secara oral adalah sesuai dan mungkin lebih baik untuk membaiki usus. Pemulihan paksi usus-otak mungkin merupakan fungsi paling penting bagi pemulihan daripada masalah alkohol.
Selank	GABA dan modulasi serotonin; bersifat menenangkan tanpa menimbulkan ketergantungan; mengurangi kegelisahan tanpa menyebabkan kantuk.	Minggu 1–8 — gunakan jika diperlukan untuk mengatasi kegelisahan; ambil setiap hari jika keinginan untuk mendapatkan zat yang meningkatkan GABA sangat kuat.	Selank sangat berharga dalam pemulihan daripada alkohol kerana kebimbangan akibat kekurangan GABA adalah punca utama keinginan dan risiko kekeliruan semula. Selank mengatasi masalah ini tanpa risiko ketagihan seperti benzodiazepine. Tidak menyebabkan mengantuk, tidak menimbulkan tabiat. Digunakan melalui saluran hidung.
Epitalon	□□□□□□□□□□□□□□□□□□ □□□□□□□	Minggu 1–4 — kitaran 10 hari, kemudian mengikut keperluan.	Gang, sleep problems can last for weeks or even months when you're recovering from drinking. Epitalon helps with the pineal gland, which alcohol messes up long term. It also protects your cells during the stressful period of early recovery.
Thymosin Beta-4 (TB-500)	Anti-inflammatory; tissue repair; liver fibrosis reduction in research models.	Months 1–3 jika terdapat masalah hati yang serius.	For individuals with alcoholic liver disease and existing fibrosis, TB-500 has demonstrated anti-fibrotic

			properties in research studies. This requires medical expertise due to the complexities of liver disease. It's not a standard treatment option, but it's worth discussing with your doctor who is managing your liver recovery.
Semax	BDNF peningkatan; pemulihan kognitif; sokongan untuk bahagian otak prefrontal; pengaturkan dopamin dan serotonin.	Weeks 2 onwards.	Alcohol causes noticeable problems with thinking and can also make the frontal part of your brain thinner. Semax helps boost a substance called BDNF, which supports the brain's ability to repair itself when you stop drinking. This is especially helpful for dealing with the mental fogginess and lack of motivation that often happens in the first 3 months of recovery.

Section 5 — Rebuilding Sleep

THE CENTURION — Alkohol tak membantu anda tidur. Ia cuma membuatkan anda pengantuk. Ini adalah dua perkara yang berbeza.

Salah satu kepercayaan yang paling umum dan berbahaya tentang gangguan penggunaan alkohol adalah bahwa alkohol membantu tidur. Alkohol memang menyebabkan sedasi—kehilangan kesadaran dengan cepat. Namun, alkohol tidak menghasilkan tidur. Ia menekan tidur REM hampir sepenuhnya, mengganggu struktur tidur, mengurangi tidur nyenyak, dan menyebabkan insomnia pada paruh kedua malam saat alkohol dimetabolisme.

The result is that years of "drinking to sleep" produce a brain that has never experienced genuine restorative sleep while drinking—and now, in early recovery, struggles to sleep at all because the sedation mechanism is gone and the brain has not practiced the natural sleep initiation process for years.

Pemulihan tidur dalam proses pemulihan alkohol adalah salah satu aspek yang paling penting dan seringkali kurang dihargai. Insomnia adalah penyebab utama yang sering disebutkan sebagai pemicu kekambuhan dini. Ini juga merupakan area yang sangat responsif terhadap suplemen dan protokol perilaku berikut.

- Melatonin (0.5–1mg, let it dissolve under the tongue, 30–60 minutes before you want to sleep) – a lower dose is more effective than a higher dose; a higher dose can mess up your body clock.
- Magnesium glycinate (300-400mg, one hour before bedtime) – helps with GABA production, reduces the harmful effects of excess glutamate, and can lower body temperature.
- Glycine (3–5g, 30 minutes before bed) — helps to lower your body temperature, which is a key factor for initiating sleep. It also acts as an NMDA co-agonist, supporting the balance between GABA and glutamate in the brain.
- L-Theanine (200–400mg in the evening) — promotes alpha waves, and helps reduce the feeling of being overly alert which can make it hard to fall asleep.
- 5-HTP (50–100mg, taken in the evening) — a substance that helps create serotonin, which then turns into melatonin. It can help improve your mood and also promote better sleep at the same time.
- Phosphatidylserine (100-200mg, taken in the evening) - helps to lower evening cortisol levels. Dysregulation of the HPA axis due to excessive alcohol consumption can increase cortisol levels and interfere with falling asleep.

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Protocol 17 (Sleep Architecture)

*   **Rationale:** Sleep is crucial for physical and mental restoration, especially during recovery. Disruptions to sleep architecture can hinder progress and
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exacerbate withdrawal symptoms. This protocol aims to optimize sleep quality and promote healthy sleep patterns.

*   **Key Considerations:**

    *   **Alcohol Avoidance:** Avoid all alcohol, including cooking alcohol and mouthwash with alcohol. Even trace amounts can activate the reward circuit and disrupt sleep architecture in early recovery.
    *   **REM Rebound Dreams:** Vivid dreams are common in early recovery and are often a result of REM rebound. These dreams are part of the healing process and should not be suppressed.

*   **Implementation:**

    1. **Establish a Regular Sleep Schedule:** Go to bed and wake up at the same time each day, even on weekends, to regulate your body's natural sleep-wake cycle.
    2. **Create a Relaxing Bedtime Routine:** Engage in calming activities before bed, such as taking a warm bath, reading a book, or listening to soothing music. Avoid screen time (phones, tablets, computers) for at least an hour before bed.
    3. **Optimize Your Sleep Environment:** Ensure your bedroom is dark, quiet, and cool. Use blackout curtains, earplugs, or a white noise machine if necessary.
    4. **Avoid Caffeine and Nicotine Before Bed:** These substances can interfere with sleep. Avoid them for at least four hours before bedtime.
    5. **Exercise Regularly:** Regular physical activity can improve sleep quality, but avoid exercising too close to bedtime.
    6. **Manage Stress:** Practice stress-reducing techniques such as meditation, yoga, or deep breathing exercises.
    7. **Address Underlying Medical Conditions:** If you have any underlying medical conditions that may be affecting your sleep, consult with a healthcare professional.

*   **Troubleshooting:**

    *   If you are having difficulty falling asleep, try getting out of bed and doing a relaxing activity until you feel sleepy.
    *   If you wake up during the night and cannot fall back asleep, avoid looking at the clock. Get out of bed and do something calming until you feel tired again.
    *   If your sleep problems persist, seek professional help from a doctor or sleep specialist.

*   **Important Note:** Medical help is not failure.
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Section 6 — Porting the Addiction: Finding Your Own GABA.

THE CENTURION — Centurian Paper C-28 Applied to Alcohol Recovery.

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	the workday is over, it's okay to relax, and you don't have to be on all the time.	sparkling water, herbal tea, or a non-alcoholic cocktail. Have a short ceremony to mark the change. The brain still needs the signal, but it doesn't need the alcohol in that signal.

The Natural GABA Architecture for Alcohol Recovery.

THE CENTURION — Membangun Sistem Brek Dalaman yang Dahulu Digunakan oleh Dadah.

The Sage constitution's recovery – and alcohol recovery in particular, which is largely, though not exclusively, a Sage story – requires building a life that provides sufficient nervous system calm through self-reliance. This isn't about eliminating stimulation. It's about developing a resilient internal regulation system that doesn't rely on substances to function.

- Sebuah amalan kontemplatif harian, sekurang-kurangnya 10 minit. Ini bukan pilihan. Ia adalah keperluan biologi yang tidak boleh dikompromi. Inilah yang membina tahap GABA semula jadi yang sebelum ini disokong oleh alkohol. Protokol 04 (Pemulihan Dharma) dalam Kompendium utama ialah rujukan.
- Vigorous aerobic exercise at least 4 times per week. The BDNF release from sustained aerobic exercise is the primary neural repair mechanism for alcohol-damaged brains. The endorphin release addresses the opioid/endorphin system simultaneously. This is not lifestyle advice — it is the most powerful non-pharmacological intervention for alcohol recovery that exists.
- A creative practice with genuine depth. The flow state is the natural GABA state – total absorption in a demanding activity quiets the anxious mind through the mechanism of full attentional engagement rather than chemical suppression. Writing, music, visual art, cooking, building. Depth over breadth.
- Authentic community. Not a performance-based community. Not a social media community. It involves in-person connections with people who understand your real situation, where you don't have to pretend. The endorphin and oxytocin systems that alcohol triggers respond specifically to this kind of connection. Twelve-step communities offer this for many individuals, and the Compendium's Protocol 04 and Protocol 08 address the social aspects of recovery in general.
- Exposure to nature as a planned activity, not just by chance. A minimum of 20 minutes daily. The recovering nervous system shows measurable normalization of cortisol levels when exposed to natural environments, unlike what happens in urban or indoor settings.

- Service. The act of genuinely helping another person activates the reward, connection, and meaning circuits simultaneously and provides the sense of being useful in the world that alcohol's social lubricant was partially producing. Many people in long-term alcohol recovery report that service is the most reliable source of sustained wellbeing they have found.

Section 7 — Navigating the Recovery Kernel: Your Protocol Map.

□□	Protocols	Main focus.	Alcohol-specific notes
Medical Detox (Days 0–7 if physically dependent)	Penyedia perubatan — bukan Kompendium.	Survival. Prevention of seizures. Medical stabilization.	The Recovery Kernel framework doesn't start here. Medical detoxification starts here. Once you are medically stable, come back to this guide and begin at the Biological Foundation phase.
Biological Foundation (Days 1–14)	Protocol 07, Protocol 09, Protocol 17, Protocol 18.	Emergency nutrition, thiamine, magnesium, sleep, gut repair.	Thiamine pada Hari ke-1. Magnesium pada Hari ke-1. Vitamin B kompleks lengkap pada Hari ke-1. Ini adalah mandatori. Sistem yang kekurangan zat tidak dapat memulai pemulihan tanpa bahan bakunya. Protokol 18 (nutrisi) dan Protokol 09 (sumbu usus-otak) adalah protokol Volume I dengan prioritas tertinggi untuk pemulihan alkohol.
Genomic Mapping (Minggu 1–4)	Section 15 (Compendium), Protocol 11, Protocol 12	GABRA2 assessment, OPRM1 for naloxone guidance, COMT constitution, MTHFR.	The GABRA2 high-risk variant and OPRM1 A118G are the two most important genetic findings related to alcohol recovery – they directly influence medical treatment decisions (such as seizure monitoring and whether or not naltrexone is appropriate). Get tested as early as possible.
GABA System Repair (Weeks 1–12)	Protocol 04, Protocol 01 craving interrupt, Section 4.2 of this guide.	GABA supplement stack, breathing exercises, mindfulness practices, anxiety management techniques.	Berbeza dengan pemulihan daripada penggunaan stimulan atau ganja, membaiki sistem GABA adalah sasaran biologi UTAMA dalam proses pemulihan alkohol—ia adalah sistem yang paling terjejas dan kekurangan dalam sistem ini secara langsung menyebabkan keinginan untuk kembali kepada pengambilan semula. Semua perkara lain berlaku dalam konteks ini.
Behavioral and Environmental Architecture (Weeks 2–	Protocol 02, Protocol 05, Protocol 06, Protocol 08, Protocol 13	Addiction transfer prevention, environmental redesign, trigger mapping, social architecture.	Transfer from alcohol to benzodiazepines is the most medically dangerous type of addiction transfer during recovery. Protocol 02 must be read immediately. Transfer to cannabis

12)			is also common among drinkers who are feeling anxious. Explicitly identify the risks associated with these transfers before they occur.
Liver and Physical Recovery (Months 1–6)	Protocol 07, Protocol 18, liver support stack (Section 4.4)	Liver function monitoring, NAC, silymarin, TUDCA, phosphatidylcholine.	Ulangsiakan ujian fungsi hati pada bulan ke-1, bulan ke-3, dan bulan ke-6 setelah berhenti minum. Hati ialah salah satu organ yang paling berupaya untuk pulih dalam badan — pemulihan ketara adalah mungkin walaupun daripada kerosakan yang teruk dengan penghentian minuman yang berterusan. Rekodkan ia. Rayakan peningkatan tersebut.
Identity and Meaning (Months 2–12)	Protocol 20, Protocol 21, Protocol 23, C-28	Identity reconstruction, the sober self, purpose architecture.	Alcohol use disorder often deeply intertwines with identity — "I am someone who drinks." For long-term drinkers, sobriety requires constructing an identity that does not have a substance-shaped hole in the middle of it. Protocol 20 (identity reconstruction) is essential.
Long Game (Months 6–24+)	Protocol 24, Protocol 25, C-28, C-31	Purpose architecture, relational repair, the natural addiction fully operational.	The brain volume restoration that occurs in the second year of sobriety is measurable on MRI and genuinely significant. The person who committed to recovery at month 1 can be neurologically different — meaningfully, measurably better — by month 18. This is not a metaphor. It is the most powerful long-term argument for sobriety that biology provides.

Section 8 — The Medical Support Layer

Alcohol use disorder has the most robust evidence base of any addiction for pharmacological treatment. The medications below are underutilized — studies consistently show that fewer than 10% of people with AUD who could benefit from these medications receive them. This is a treatment gap that costs lives.

Bawa bahagian ini berjumpa doktor anda. Tanya terus tentang pilihan-pilihan ini. Kerangka kerja Recovery Kernel dan rawatan farmakologi tidak bersaing antara satu sama lain – ia direka untuk bekerjasama.

FDA-approved medications for alcohol use disorder:

* **Naltrexone (ReVia, Vivitrol)**
* **Acamprosate (Campral)**
* **Disulfiram (Antabuse)**

Medication.	Mechanism	□□□□□	Genomic and clinical considerations.
Naltrexone (oral or monthly injection / Vivitrol).	Opioid receptor antagonist – blocks the endorphin reward signal from alcohol, reducing the "wanting" and the reward.	Strong - supported by multiple randomized controlled trials; FDA approved.	OPRM1 A118G carriers show dramatically superior response – up to 3x better outcomes. If you know you carry this variant, naltrexone is likely your highest-efficacy medication. Monthly injection (Vivitrol) removes the daily compliance variable. The Sinclair Method – taking naltrexone before each drinking episode to extinguish the reward response – is a validated harm reduction approach for those not ready for abstinence.
Acamprosate (Campral)	GABA dan modulasi glutamat — mengurangkan kesan berlebihan akibat alkohol semasa penarikan diri dan PAWS; mengurangkan keresahan semasa berhenti minum.	Strong - FDA approved; particularly effective for PAWS.	Particularly relevant for individuals with a GABA-deficit profile (GABRA2 high-risk) and those experiencing severe Post-Acute Withdrawal Syndrome (PAWS). It is renally cleared, meaning it's processed by the kidneys rather than the liver, which is beneficial during alcohol recovery when liver function

			may be impaired. It does not interact with any liver support supplements. Begin taking it during or immediately after detoxification.
Disulfiram (Antabuse)	ALDH2 inhibition — menghalang penghapusan asetaldehida, menyebabkan mual teruk, kemerahan, dan ketidakselesaan jika alkohol diambil.	Moderate – aversion strategy; effective when compliance is supervised.	Works by making drinking immediately and severely punishing. Most effective when dosing is observed (partner, pharmacist, or program). Not appropriate for ALDH2*2 carriers — already have impaired acetaldehyde clearance; disulfiram would intensify an already existing biological deterrent. Requires absolute commitment to abstinence as it makes drinking medically dangerous.
GLP-1 agonists (semaglutide, tirzepatide)	Kurangkan keinginan minum alkohol melalui modulasi dopamin dan sistem penghargaan; data dari tahun 2025-2026 menunjukkan pengurangan antara 50-60% dalam jumlah episode minum.	Emerging – strong observational data; clinical trials ongoing as of 2026.	The most significant development in alcohol treatment pharmacology in years. The mechanism appears to reduce the 'wanting' quality of alcohol craving — the compulsive pull toward the substance — rather than merely the reward once consumed. For patients with both AUD and metabolic concerns, this may address both simultaneously. Discuss with your physician.
Gabapentin	GABA-modulating anticonvulsant – helps reduce withdrawal symptoms and Post-Acute Withdrawal Syndrome (PAWS); especially useful for managing sleep problems and anxiety.	Moderate – penggunaan luar label; terdapat bukti yang signifikan untuk masalah penyalahgunaan alkohol.	Useful for managing PAWS (Post-Acute Withdrawal Syndrome) and sleep problems during the first 1-3 months. CAUTION: Gabapentin itself carries a risk of dependence, especially in individuals with a history of addiction. Use it within specified time limits and under physician supervision. Individuals with a GABRA2 high-risk profile may benefit the most but also have the highest risk of misuse – monitor them carefully.

A Final Word

THE CENTURION — The system that chose alcohol wasn't broken. It was solving a real problem, but doing it poorly.

The GABA system that couldn't quiet itself. The endorphin system that couldn't generate adequate social warmth. The dopamine system that couldn't find enough reward in the ordinary texture of daily life. The methylation system that couldn't synthesize sufficient serotonin. These are not character defects. They are biological vulnerabilities—specific, genetic, and addressable.

Alcohol helped solve these problems. For many years, maybe even decades, it provided a solution. It was a genuine solution. But at the same time, it was also destroying everything else.

Apa yang ditawarkan oleh Recovery Kernel adalah sejenis penyelesaian yang berbeza — lebih perlahan, kurang dramatik, memerlukan latihan harian, sokongan biologi, komuniti dan masa. Tetapi ia adalah penyelesaian yang tidak memakan apa yang sebelum ini dimakan oleh alkohol. Ia tidak mengehadkan hidup anda kepada satu-satunya soalan: bila pula minuman seterusnya akan datang.

The brain volume lost to alcohol can grow back. The GABA receptors recover. The serotonin system rebuilds. The liver heals. Relationships that were strained can be repaired – not all of them, and not quickly, but meaningfully. Cognitive function that was impaired by alcohol returns, often surpassing the pre-drinking baseline because the tools built in recovery – the breathwork, the sleep, the nutrition, the exercise, the contemplative practice – are actively building a more capable brain than the one that started drinking.

The Recovery Kernel was created for individuals who required a more detailed guide than the standard one provided. Now, you have an alcohol-specific version of that guide.

Navigasi terus di bahagian utama Kompendium. Gunakan ia.

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Refer to the Recovery Kernel Complete Centurion Compendium for all referenced protocols.

Crisis: call or text 988 | Emergency: 911 | SAMHSA: 1-800-662-4357

⚠ HARM REDUCTION RESOURCE — NOT MEDICAL ADVICE

Cara Pulihkan Diri dari Ketergantungan Alkohol Menggunakan Recovery Kernel | Siri Navigasi Berdasarkan Jenis Bahan.